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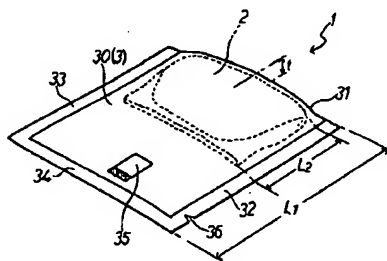
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(54)【発明の名称】 使い捨ておむつの個装構造

(57)【要約】

【課題】 コンパクトで持ち運びに便利であり、着用在が容易であり、更には衛生的に廃棄できる使い捨ておむつの個装構造を提供すること。

【解決手段】 使い捨ておむつ2を包装材3で個装してなる使い捨ておむつの個装構造であって、上記包装材3は、密閉され且つ内部に使い捨ておむつが封入されてなる個装袋30を形成しており、上記個装袋30は、使い捨ておむつをその厚み方向に圧縮した状態を維持するようになされていることを特徴とする使い捨ておむつの個装構造。



【特許請求の範囲】

【請求項1】 使い捨ておむつの個装構造であって、上記包装材は、密閉され且つ内部に使い捨ておむつが封入されてなる個装袋を形成しており、上記個装袋は、使い捨ておむつをその厚み方向に圧縮した状態を維持するようになされていることを特徴とする使い捨ておむつの個装構造。

【請求項2】 上記使い捨ておむつは、折り畳まれて個装されていることを特徴とする請求項1記載の使い捨ておむつの個装構造。

【請求項3】 上記使い捨ておむつは、パンツ型の使い捨ておむつであることを特徴とする請求項1記載の使い捨ておむつの個装構造。

【請求項4】 上記包装材は、廃棄時に再封可能な止着手段を備えることを特徴とする請求項1記載の使い捨ておむつの個装構造。

【請求項5】 請求項1記載の使い捨ておむつの個装構造の製造方法であって、

上記使い捨ておむつを包装材で覆った後、該使い捨ておむつを包装材と共に圧縮及び／又は脱気し、該包装材の所定位置を封止する、封止工程を具備することを特徴とする使い捨ておむつの個装構造の製造方法。

【発明の詳細な説明】

【0001】

【発明の属する技術】本発明は、幼児用、大人用、失禁者用として排泄物を収容保持するために用いられる使い捨ておむつを包装材で個装してなる使い捨ておむつの個装構造に関し、更に具体的には、コンパクトでかつ衛生的な持ち運び性に優れた使い捨ておむつの個装構造に関する。

【0002】

【従来の技術及び発明が解決しようとする課題】使い捨ておむつとしては、テープファスナーなどの締結手段を有するフラット型の使い捨ておむつ（以下、「フラット型おむつ」という）が主として用いられている他、最近では、おむつの腹側部の左右両側縁と背側部の左右両側縁とが接合固定されて、左右一対のレッグ開口部と一つのウエスト開口部が形成されてなるパンツ型の使い捨ておむつ（以下、「パンツ型おむつ」という）が、広く用いられている。

【0003】このような使い捨ておむつは、通常、折り畳む等して数枚が纏めて包装されて、販売されている。従来より、使い捨ておむつを折り畳む方法については、種々提案されており、例えば、フラット型おむつにおいては、吸収体の左右両側に延出されているサイドフラップをトップシート側に向けて折り畳んだあと、おむつが腹側部、背側部及び股下部の3つに区分されるように、3つ折り折り畳む方法が提案されている。そして、この方法によれば、使用時に展開した場合に、ある程度の

折り癖がついているため、おむつがその長手方向に向けて船型、即ち、着用者の体型に沿った形状を呈し、装着性が良好であるという利点がある。一方、パンツ型おむつにおいては、一般的には、特に折り畳むなどされていないが、最近では、コンパクトに折り畳んで携帯性を向上させたり、包装状態の見栄えを良くし且つ店頭での陳列時に転倒しにくいようにするために、種々の折り込み方法が提案されている。

【0004】ところで、使い捨ておむつの吸収体としては、一般に、解繊バルブを主材とし、高分子吸水ポリマーを併用してなるものを用いている。該解繊バルブは、比較的安価に入手することができる吸液性の高い素材であり、ほとんどの使い捨ておむつに使用されているが、近年においては、該解繊バルブに代えて合成繊維を使用したり、該解繊バルブと合成繊維とを混合して使用することも提案されている。

【0005】上記吸収体は、使用されている解繊バルブや合成繊維の使用量に応じた厚みを有する。一般に、使い捨ておむつの薄さは吸収体の厚みに大きく依存する。なぜなら使い捨ておむつの製品厚みを極めて薄くしようとする場合、吸収体以外の部材の厚みを薄くするように材料を選択して効果を上げることは困難だからである。従って、使い捨ておむつの薄さは、吸収体を構成する解繊バルブや合成繊維の使用量に依存する。ここで、使い捨ておむつの1枚あたりの厚みが大きすぎると、使い捨ておむつを着用者に装着させた場合に不恰好であるだけでなく、持ち運びに不便となり、また運搬スペースや店頭での販売スペースの確保も困難になるという問題がある。このため、製品性能を維持しつつ、使い捨ておむつを薄型化することが要望されている。

【0006】そこで、使い捨ておむつの吸収体使用する繊維量を減らすことにより、使い捨ておむつの厚みを薄くすることが考えられているが、使い捨ておむつの性能を維持しつつ厚みを薄くすることには限界がある。また、おむつの製造工程においてプレス工程を行うことにより（該プレス工程は、特に吸収体単体を圧縮して成形する工程である）、おむつの厚さを薄くすることも提案されている。しかし、プレスにより圧縮された吸収体であっても、繊維は弾性を有するために、繊維が弾性回復した際生じるすき間に周囲の空気が入り込んで、おむつの厚みは時間とともに回復してしまう（厚みを増してしまう）。また、弾性回復できないまでに圧縮すると、使い捨ておむつがバリバリに硬くなりすぎたり、極端に性能が低下するという問題がある。例えば、現在市販されている使い捨ておむつは、ほとんどが圧縮包装されているが、いったん袋から取り出して負荷ゼロの状態の数時間放置しておくとその厚さは膨らんでしまい、持ち運ぶ際の携帯性には劣ってしまうという問題がある。

【0007】また、使い終わった使い捨ておむつはゴミ箱に廃棄されるが、かなりコンパクトに丸めても若干の

においが残り、ゴミ箱の中の悪臭の原因となるという問題がある。特に、パンツ型おむつにあっては、あまりコンパクトに丸められないため、上記問題が多い。

【0008】要するに、従来の使い捨ておむつは開封後、その厚みが回復して厚くなってしまうために、①着用しにくい（着用させにくい）、②持ち運びに不便、かさばる等の問題があり、また、衛生的に廃棄することができないという問題もあった。特に、これらの問題は、外出時などの個々の使い捨ておむつを持ち運ぶ際に顕著である。また外出時には使用後のおむつを持ち帰らなければいけない場合が多い。従って、上述の問題のない使い捨ておむつ（又はその包装構造）が要望されているのが現状である。

【0009】従って、本発明の目的は、コンパクトで持ち運びに便利であり、着用が容易であり、更には衛生的に廃棄できる使い捨ておむつの包装構造を提供することにある。

【0010】

【課題を解決するための手段】本発明は、使い捨ておむつを包装材で個装してなる使い捨ておむつの包装構造であって、上記包装材は、密閉され且つ内部に使い捨ておむつが封入されてなる個装袋を形成しており、上記個装袋は、使い捨ておむつをその厚み方向に圧縮した状態を維持するようになされていることを特徴とする使い捨ておむつの包装構造を提供することにより、上記目的を達成したものである。また、本発明は、上記使い捨ておむつは、折り畳まれて個装されている使い捨ておむつの包装構造を提供するものである。また、本発明は、上記使い捨ておむつは、パンツ型の使い捨ておむつである使い捨ておむつの包装構造を提供するものである。また、本発明は、上記包装材は、廃棄時に再封可能な止着手段を備える使い捨ておむつの包装構造を提供するものである。更に、本発明は、上記包装構造の好ましい製造方法として、使い捨ておむつの包装構造の製造方法であって、上記使い捨ておむつを包装材で覆った後、該使い捨ておむつを包装材と共に圧縮及び/又は脱気し、該包装材の所定位置を封止する、封止工程を具備するおむつの包装構造の製造方法を提供するものである。

【0011】

【発明の実施の形態】以下、添付図面を参照しつつ、本発明の使い捨ておむつの包装構造について詳細に説明する。尚、以下の形態においては幼児用の使い捨ておむつを例に用いて説明する。ここで、図1は、本発明の使い捨ておむつの包装構造の第1の形態を示す斜視図であり、図2は、図1に示す包装構造において用いられる使い捨ておむつを示す斜視図であり、図3は、図1に示す包装構造において用いられる包装材を示す展開図である。

【0012】図1に示す本形態の使い捨ておむつの包装構造1は、使い捨ておむつ2を包装材3で個装してなる

ものである。

【0013】ここで、上記包装構造1において用いられる使い捨ておむつ2は、図2に示すように、腹側部21の左右両側縁と背側部22の左右両側縁とがそれぞれ接合固定されてなる、少なくとも1つのウエスト用開口と1対のレッグホール開口を有し公知の構成のパンツ型の使い捨ておむつであり、各部材の構成材料（トップシート、バックシート、吸収体及び弾性部材などの構成材料）も、通常公知のものを特に制限無く用いることができる。

【0014】また、上記包装構造1において用いられる包装材3は、図3に示すように、長方形のシートであり、長手方向中央における折曲部31で2つ折りにされて、図1に示す包装構造を形成している。上記包装材3を形成する上記シートとしては、溶着加工性に優れる、ポリエチレン、ポリプロピレン、ナイロン、塩化ビニル等のプラスチックフィルム等が好ましく用いられ、特に本形態においては、ポリエチレンフィルムを用いている。また、上記包装材3は、上記折曲部31以外の3辺32、33、34がヒートシールされて、シールされている。

【0015】而して、上記包装材3は、密閉され且つ内部に使い捨ておむつ2が封入されてなる個装袋30形成しており、上記個装袋30は、使い捨ておむつ2をその厚み方向に圧縮した状態を維持するようになされている。ここで、上記「厚み方向に圧縮した状態を維持する」とは、使い捨ておむつに何等外力を加えずに、大気中に放置している状態に比して、厚みが薄くなっている状態を維持することを意味する。

【0016】更に詳述すると、上記包装材3は、図3に示す折曲部31において折り曲げられており、図1に示すように3辺32、33、34がシールされて、密閉された個装袋30を形成している。

【0017】また、上記使い捨ておむつ2は、折り畳まれて上記個装袋30の内部に封入されて個装されている。この際、上記使い捨ておむつ2は、その上下方向（腹側部21と股下部23とをつなぐ方向）のほぼ中央（図2に示す2a）において、上下方向に向けて折り畳まれている。そして、図1に示すように、上記個装袋30の長さ L_1 は、折り畳まれた使い捨ておむつ2の長さ L_2 （上下方向の長さ）のほぼ2倍となるようになされている。使用後のおむつを封入して廃棄できる大きさになっている。

【0018】また、上記包装材3は、廃棄時止着用の通常の止着テープ35が設けられている。上記止着テープ35は、上記包装材3により形成された個装袋30の幅方向（おむつの幅方向に対応した方向）ほぼ中央部分に配されている。

【0019】上記包装構造1における使い捨ておむつ2の厚み比率は、15～85%とするのが好ましく、40

～60%とするのが更に好ましい。上記厚み比率が15%未満であると、おむつが硬くなり風合いが悪くなってしまう、85%を超えると、厚みの回復を抑える効果が弱まるので、上記範囲内とするのが好ましい。ここで、上記「厚み比率」とは、下記の如くして求められるものである。即ち、「一般的な、複数枚の使い捨ておむつを包装になる包装構造」を開封して、使い捨ておむつを常温・常湿で且つ無負荷の状態で、7日間放置した場合のおむつの厚み（本形態においては折り畳んだおむつの厚み）を測定し、これを100とする。そして、これに対して本発明の「個装構造」におけるおむつの厚み（図1に示す μ ）を測定してパーセント表示することにより求められる。尚、上記「厚み」は、おむつの幅方向略中央における吸収体を含んだおむつの製品厚みである。

【0020】また、図1に示すように、上記個装袋30には、その一辺32に切り欠きノッチ36が設けられており、個装袋30の開封が容易となるようになされている。また、本形態においては、上述の如く、包装材3として1軸方向に分子配向されているシートを用いており、この分子配向方向に向けて上記切り欠きノッチ36が設けられている。これにより、個装袋30を裂く方向と分子配向方向とが同一の方向であるため、個装袋30の開封が容易となっている。

【0021】このように構成される本形態の個装構造1は、上記切り欠きノッチ36から袋を開封し、使い捨ておむつ2を取り出すことにより、使用に供することができ、更に使用後においては、着用者から取り外したおむつを、上記個装袋30内に封入し、上記止着テープ35により袋の止着を行い、廃棄することができる。

【0022】本形態の個装構造1は、上述の如く構成されているので、おむつの吸収体の弾性回復が制限され、また、2つ折りにされた使い捨ておむつ2の折りに対する弾性回復も制限される。従って、個装構造1を無負荷の状態においても、使い捨ておむつ2が個装袋30に封入されている間は、おむつの厚みを増す（回復する）ことがなく、コンパクトなまま保たれ、携帯性に優れる。また上述の如く使用、袋内に密閉して廃棄できるものであるため、衛生的に廃棄できるものである。従って、特に、外出時などにおいて持ち運ぶものとして優れている。

【0023】次いで、本形態の個装構造1の製造方法について図4を参照して説明する。ここで、図4は、本発明の使い捨ておむつの個装構造の好ましい製造方法の要部を示す概略図である。

【0024】本形態の個装構造1を製造するには、図4に示すように、上記使い捨ておむつ2を包装材3で覆った後、該使い捨ておむつ2を包装材3ごと圧縮して包装材内部の空気を押し出し乍ら、又は、強制的に脱気し乍ら、該包装材3の所定位置を封止する、封止工程を行うことにより実施できる。尚、上記封止工程以外の工程、

即ち使い捨ておむつ2の製造工程等は、通常公知の方法を特に制限無く用いて行うことができる。

【0025】更に詳述すると、上記封止工程は、折曲部31で2つ折りにされた包装材3中に、2つ折りにした使い捨ておむつ2を封入し、圧縮ロール又は圧縮コンベアベルト（図示せず）等により、図4の矢印方向にすなわちおむつの厚み方向に圧力を掛けて包装材3の内部及び使い捨ておむつ2内の空気を押し出しながら、包装材3の3辺32、33、34をシールして封止し、個装袋30を形成することにより行うことができる。そして、更に、切り欠きノッチ36を常法に従って形成し、止着テープ35を貼着することにより、図1に示す第1の形態の包装構造1を製造できる。即ち、上記の封止される上記「所定位置」は、包装材3における封止されていない周辺部分を意味し、本形態においては、上記折曲部31を除く3辺32、33、34を意味する。

【0026】上記圧縮ロール又は圧縮コンベアの材質としては、鉄、ゴム、スポンジ、プラスチック等公知の材料を用いることができる。強圧縮の個装製品を得るためには、例えば、クリアランス0.5mmのスキ間にて線圧10～20kgf/cmの鉄ロール間で圧縮をかける等の方法を用いる。

【0027】また、本形態において、おむつの折り畳み形態は、図1に示す形態に限定されない。例えば、図5に示すように、腹側部21及び背側部22の左右両側で且つ吸収体が存在しない部分である、サイドフラップ部分24をおむつの内方に向けて折り込んで折り畳んでもよい。また、図6に示すように、断面がW形状になるよう上下方向に向けて折り畳んでもよい。

【0028】また、本発明の個装構造に用いられる使い捨ておむつは、図7に示すような、いわゆる展開型の使い捨ておむつでもよい。即ち、トップシートと、バックシートと、両シート間に介在する吸収体とを具備し、吸収体の周縁に位置するウエスト部とレッグ部とに、それぞれ弾性部材が配されてなる、公知の展開型の使い捨ておむつを用いることもできる。この場合、おむつは、図7に示すように、展開型の使い捨ておむつ2Aが、その吸収体の両側に延出するサイドフラップ部分24Aをトップシート側に折り込んだあと、ほぼC形状になるように3つ折りにされるのが好ましい。そして、図8に示すように、3つ折りにされた展開型の使い捨ておむつ2Aが、上記の第1の形態の個装構造と同様に、個装袋30A内に封入されて個装されて、個装構造1Aが形成されているのが好ましい。

【0029】個装されていない折り畳まれた展開型の使い捨ておむつ2Aは、無負荷の状態にあると一般に吸収体の弾性回復や素材の弾性回復又は弾性部材の収縮作用などによって折り目が回復して形状が崩れ、厚さを増していくが、本形態の個装構造1Aにおいては、コンパクト性が損なわれない。また、このように3つ折されたフラ

ット型の使い捨ておむつを開封して使用に供する際には、レップ部に弾性部材が設けられているため、トップシート側に向けて舟型に湾曲する。このため、着用時における装着性に優れる。従って、携帯性に優れ装着性にも優れる。

【0030】次いで、図9及び10を参照して本発明の個装構造の他の形態について説明する。尚、以下の形態においては、特に、上記の第1の形態と異なる点について説明する。特に詳述しない点については、上述した第1の形態においてした説明が適宜適用される。ここで、

図9は、本発明の使い捨ておむつの個装構造の第2の形態を示す斜視図であり、図10は、本発明の使い捨ておむつの個装構造の第3の形態を示す斜視図である。

【0031】図9に示す第2の形態においては、個装袋30の大きさが上記の第1の形態と異なる。即ち、図9に示すように、本形態の個装袋1においては、上記個装袋30の長さ l_1 が、2つ折りにされた使い捨ておむつの長さ l_2 とほぼ同じとなるようになされている。また、切り欠きノッチ36は、一辺34側に設けられている。

【0032】図10に示す第3の形態においては、個装袋30の形状（封止形状）が上記の第1の形態と異なる。即ち、図10に示すように、本形態の個装袋1においては、上記個装袋30がビロー型の個装形態となるように、前後の両端縁32'、33'及び一面側における中央部34'においてシールされている。このように、包装材3の封止箇所（即ち、個装袋30の封止形状）は、特に制限されない。上記の第2～5の形態においても、上述の第1の形態と同様の効果が奏される。

【0033】尚、本発明は、上述の形態に制限されるものではなく、本発明の趣旨を逸脱しない範囲で種々変更が可能である。例えば、上記切り欠きノッチ36を設ける代わりに、ミシン目等を設けたり、個装袋30を開封用のひも等を添設して、開封を容易にすることもできる。尚、これらの場合において、開封により個装袋が破断されてゴミが発生しないようにするのが好ましい。また、廃棄時に再封可能な手段としては上記止着テープ35を設けるほか、紐を添設したり、あらかじめ接着剤等を塗工したり、袋の大きさを袋自体で結束可能であるように形成することにより、廃棄時に個装袋を封止できるようにすることもできる。また、上記個装袋30のシールは、ヒートシールではなくインパルスシールや超音波接合、高周波接合による溶着あるいは、接着剤により接着したり、圧着する等して行うことができる。また、本発明の個装構造1の製造に際しては、上記の圧力をかけて、個装袋内の空気を脱気する代わりに、吸気ポンプ等により、個装袋内の空気を吸気したあと、封止を行っても良い。即ち、上記の好ましい製造方法における圧縮・封止工程に代えて、個装袋内の空気を吸引して脱気した後所定箇所を封止する、脱気・封止工程を行うことによ

り、本発明の個装構造を製造することもできる。

【0034】

【実施例】以下、本発明を実施例及び比較例により具体的に説明するが、本発明は、これらに限定されるものではない。

【0035】〔実施例1〕複数枚のパンツ型おむつを圧縮包装してなる通常の圧縮包装品から取り出した通常のパンツ型使い捨ておむつを使い捨ておむつとして用い、ポリエチレンフィルムを包装材として用いた。そして、圧縮包装品から取り出した使い捨ておむつをすぐに包装材中に封入し、圧縮荷重5kgf/枚で圧縮して包装材中の空気を押し出し、更に包装材の各辺をヒートシールして封止した（封止工程）。尚、おむつは、2つに折り畳んで個装し、図1に示す形状の個装構造を作成した。また、圧縮は、おむつ1枚（折り畳んだ状態のもの）を包装材からなる個装袋の中に入れた後、該個装袋上にアクリル板を乗せ、更にその上に上記圧縮荷重分のおもりを乗せることにより行った。得られた個装構造について、保存条件を常温・常湿として厚みの経時変化を調べた。その結果を図11に示す。また、厚みは、ダイヤルゲージ（ミットヨ社製 code No.575-113）及びスタンド（ミットヨ社製 code No.7002）を用いて測定した。（ $n=10$ ）

【0036】〔実施例2〕圧縮荷重を15kgf/枚とした以外は、実施例1と同様にして個装構造を得、おむつの厚みの経時変化を測定した。その結果を図11に示す。

【0037】〔実施例3〕圧縮荷重を25kgf/枚とした以外は、実施例1と同様にして個装構造を得、おむつの厚みの経時変化を測定した。その結果を図11に示す。

【0038】〔比較例1〕個装構造としない以外、即ち、おむつのみとした以外は、実施例1と同様にして、おむつの厚みの経時変化を測定した。その結果を図11に示す。

【0039】ここで、上記厚み比率は、それぞれ、実施例1で70%、実施例2で60%、実施例3で55%であり、図11より明らかなように、実施例1～3の包装構造においては、7日経過後の厚み変化は見られなかった。

【0040】

【発明の効果】本発明の使い捨ておむつの個装構造は、コンパクトでかつ衛生的な持ち運びに便利であり、着用が容易であり、更には衛生的に廃棄できるものである。

【0041】具体的には、①個装袋内は外気から遮断されており、吸収体はその厚みを回復するために必要となる周囲の空気が存在せず、個装袋を開封するまでは、吸収体が一定の厚み以上の厚さにならない。従って、本発明の個装構造は、無負荷の状態でも、コンパクトで携帯性に優れ、着用者が装着したり、着用者に装着させたり

することが容易である。

②使用済の使い捨ておむつを、開封した個装袋内に封入して廃棄できるので、においを外に出さずに、衛生的に廃棄することができる。

③更に、個装されているためにきわめて衛生的に保存、衛生的に持ち運びが可能であり、また、空気に触れないので経時的な変色や、製品性能の劣化を抑制することも可能である。

【図面の簡単な説明】

【図1】図1は、本発明の使い捨ておむつの個装構造の第1の形態を示す斜視図である。

【図2】図2は、図1に示す個装構造において用いられる使い捨ておむつを示す斜視図である。

【図3】図3は、図1に示す個装構造において用いられる包装材を示す展開図である。

【図4】図4は、本発明の使い捨ておむつの個装構造の製造方法の要部を示す概略図である。

【図5】図5は、第1の形態における使い捨ておむつの折り畳み形態の他の例を示す斜視図である。

【図6】図6は、第1の形態における使い捨ておむつの折り畳み形態の他の例を示す斜視図である。

【図7】図7は、第1の形態において用いられる使い捨ておむつの他の例を示す斜視図である。

【図8】図8は、図7に示す使い捨ておむつを用いてな

る本発明の使い捨ておむつの個装構造の第1の形態を示す斜視図である。

【図9】図9は、本発明の使い捨ておむつの個装構造の第2の形態を示す斜視図である。

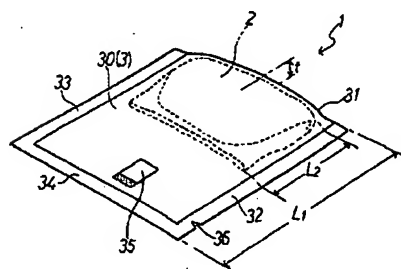
【図10】図10は、本発明の使い捨ておむつの個装構造の第3の形態を示す斜視図である。

【図11】図11は、実施例及び比較例の結果を示すグラフである。

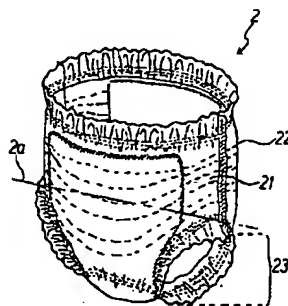
【符号の説明】

- 1 個装構造
- 2 使い捨ておむつ
- 21 腹側部
- 22 背側部
- 23 股下部
- 24 サイドフラップ部分
- 3 包装材
- 30 個装袋
- 31 折曲部
- 32 一辺
- 33 一辺
- 34 一辺
- 35 止着テープ
- 36 切り欠きノッチ

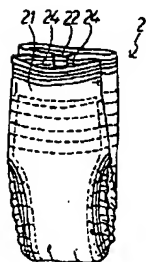
【図1】



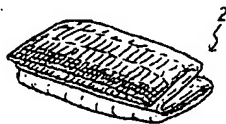
【図2】



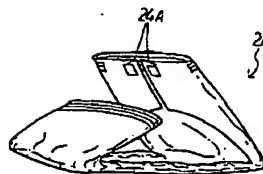
【図5】



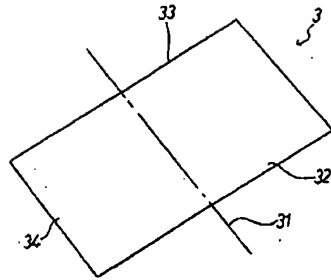
【図6】



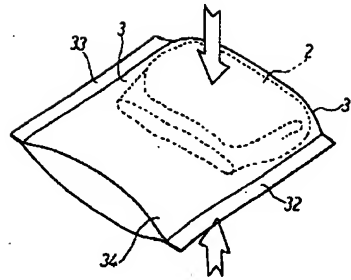
【図7】



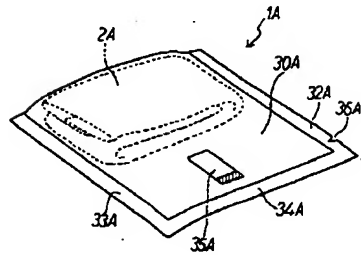
【図3】



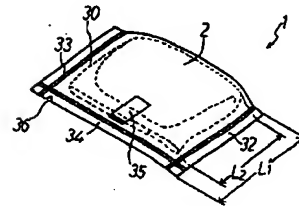
【図4】



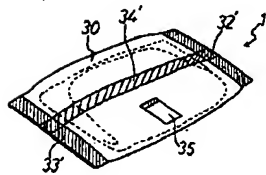
【図8】



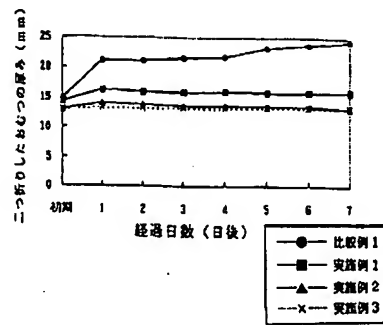
【図9】



【図10】



【図11】



フロントページの続き

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JP 10-095,481 A

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WPI Acc No: 1998-280166/ 199825

Packaging structure for throw-away baby's napkin - is compact and sanitary

Patent Assignee: KAO CORP (KAOS)

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No Kind Date Applicat No Kind Date Week

JP 10095481 A 19980414 JP 96248066 A 19960919 199825 B

Priority Applications (No Type Date): JP 96248066 A 19960919

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

JP 10095481 A 7 B65D-085/16

Abstract (Basic): JP 10095481 A

A throw-away baby's napkin is packaged by using a packaging member. The packaging member (3) is formed in a closed packaging bag (30) for sealing the napkin. The packaging bag is fabricated so as to maintain a state for pressing the napkin in a thickness direction of the napkin.

USE - The packing structure is suitable for carrying a folded napkin.

ADVANTAGE - The structure is compact and sanitary while facilitating handling of a used napkin.

Dwg.1/11

Derwent Class: D22; F07; P32; Q34

International Patent Class (Main): B65D-085/16

International Patent Class (Additional): A61F-005/44; A61F-013/15

PATENT ABSTRACTS OF JAPAN

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A61F 5/44
// A61F 13/15

(21)Application number : 08-248066

(71)Applicant : KAO CORP

(22)Date of filing : 19.09.1996

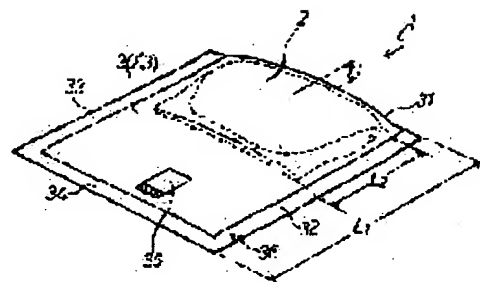
(72)Inventor : NARAWA MIKA
TAKEI SHINOBU
HAYASE TORU
ANDO KENJI

(54) SINGLE PACKAGING STRUCTURE OF DISPOSABLE DIAPER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a diaper package which is compact and easily carried and put on one's body easily and also hygienically disposed, by keeping the state compressed in the thickness direction, in a single packaged bag of which a packaging material is hermetically sealed to enclose a disposable diaper in the inside.

SOLUTION: A disposable diaper 2 is a pants type having one opening for the waist and a pair of openings for the legs. The packaging material 3 is a rectangular sheet and it is folded doubly at the folding part 31 in the longitudinal center to form a single packaged structure 1. Polyethylene film is used for the sheet and three sides except the folding part 31 are heat-sealed. The packaging material 3 is hermetically sealed. The packaging material 3 is kept in a state compressed in the thickness direction thereof and folded and enclosed in the inside of the single packaged bag 30. The length L1 of the single packaged bag 30 is about two times of the length L2 of the folded disposable diaper 2 and hence, a used diaper can be enclosed in the bag and disposed.



LEGAL STATUS

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26.06.2002

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[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection] 2004-20587

[Date of requesting appeal against examiner's decision of rejection] 06.10.2004

[Date of extinction of right]

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3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] It is the unit protection structure of the disposable diaper which it is the unit protection structure of the disposable diaper which comes to carry out the unit protection of the disposable diaper by the packing material, and the above-mentioned packing material is sealed, and forms the unit protection bag with which it comes to enclose a disposable diaper with the interior, and is characterized by making the above-mentioned unit protection bag as [maintain / the condition of having compressed the disposable diaper in the thickness direction].

[Claim 2] The above-mentioned disposable diaper is the unit protection structure of the disposable diaper according to claim 1 characterized by folding up and carrying out the unit protection.

[Claim 3] The above-mentioned disposable diaper is the unit protection structure of the disposable diaper according to claim 1 characterized by being the disposable diaper of a trousers mold.

[Claim 4] The above-mentioned packing material is the unit protection structure of the disposable diaper according to claim 1 characterized by having the firm attachment means which can be resealed at the time of abandonment.

[Claim 5] The manufacture approach of the unit protection structure of the disposable diaper which is the manufacture approach of the unit protection structure of a disposable diaper according to claim 1, and is characterized by providing the closure process which compresses and/or deaerates this disposable diaper with a packing material, and closes the predetermined location of this packing material after covering the above-mentioned disposable diaper by the packing material.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technique in which invention belongs] This invention still more specifically relates to the unit protection structure of a disposable diaper excellent in compact and sanitary carrying nature about the unit protection structure of the disposable diaper which comes to carry out the unit protection of the disposable diaper used in order to carry out hold maintenance of the excrement as the object for small children, the object for adults, and an object for incontinentia persons by the packing material.

[0002]

[Description of the Prior Art] As a disposable diaper, the disposable diaper (henceforth a "flat mold diaper") of the flat mold which has conclusion means, such as a tape fastener, is mainly used, and also recently Junction immobilization of the right-and-left edges on both sides of the antinode flank of a diaper and the right-and-left edges on both sides of the back is carried out, and the disposable diaper (henceforth a "trousers mold diaper") of the trousers mold with which it comes to form leg opening of a right-and-left pair and one waist opening is used widely.

[0003] Such a disposable diaper usually carries out folding up etc., several sheets pack it, is packed and is sold. after turn to a top sheet side the side flap which be propose variously, for example, have extend on right and left both sides of an absorber in the flat mold diaper and fold it up about the approach of fold up a disposable diaper conventionally, the approach of fold up at 3 chip boxes be propose so that a diaper may be classify into three, an antinode flank, the back, and the length from the crotch to the cuff section. And since according to this approach a certain amount of chip box peculiarity sticks when it develops at the time of use, the configuration where the diaper met the model of a ship, i.e., a wearer's form, towards that longitudinal direction is presented, and there is an advantage that wearing nature is good. On the other hand, although folding up etc. is not carried out especially generally in the trousers mold diaper, in order to fold up in a compact, to raise portability, to improve appearance of a package condition and to make it be hard to fall at the time of exhibition at a shop front, recently, the approach to insert in versatility is proposed.

[0004] By the way, as an absorber of a disposable diaper, split pulp is used as a principal member and, generally the thing which comes to use a macromolecule water absorption polymer together is used. Although this split pulp is the absorbency high material which can come to hand comparatively cheaply and it is used for almost all the disposable diaper, in recent years, it replaces with this split pulp, and a synthetic fiber is used or mixing and using this split pulp and a synthetic fiber is also proposed.

[0005] The above-mentioned absorber has the thickness according to the amount of the split pulp currently used or the synthetic fiber used. Generally, the thinness of a disposable diaper is greatly dependent on the thickness of an absorber. It is because it is difficult to choose an ingredient and to raise effectiveness so that thickness of members other than an absorber may be made thin when it is going to make product thickness of a disposable diaper very thin. Therefore, the thinness of a disposable diaper is dependent on the amount of the split pulp which constitutes an absorber, or the synthetic fiber used. Here, when the thickness per sheet of a disposable diaper is too large, and a wearer is made to carry a disposable diaper, there is a problem it is not only ill-shaped, but that become inconvenient to carrying and reservation of a conveyance tooth space or the selling tooth space in a shop front becomes difficult. For this reason, it is requested that a disposable diaper is thin-shape-ized, maintaining product performance.

[0006] Then, although it considers making thickness of a disposable diaper thin by reducing the amount of fiber used for the absorber of a disposable diaper, there is a limitation in making thickness thin, maintaining the

engine performance of a disposable diaper. Moreover, making thin thickness of (this especially press process is a process which compresses and fabricates an absorber simple substance), and a diaper is also proposed by performing a press process in the production process of a diaper. However, since fiber has elasticity even if it is the absorber compressed with a press, surrounding air enters the crevice produced when fiber carries out elastic recovery, and the thickness of a diaper is recovered with time amount (thickness will be increased). Moreover, by the time it cannot carry out elastic recovery, when it will compress, there is a problem that a disposable diaper becomes hard to Paris Paris too much, or the engine performance falls extremely. For example, although the compression package of most is carried out, when the disposable diaper by which current marketing is carried out is once picked out from a bag and leaves it in the load zero state for several hours, the thickness swells and the problem of being inferior has it in the portability at the time of carrying.

[0007] Moreover, although the disposable diaper which it finished using is discarded by the garbage can, even if it rounds off in a compact considerably, some smell remains, and there is a problem of becoming the cause of the offensive odor in a garbage can. If it is in a trousers mold diaper especially, since it is seldom rounded off by the compact, there are many above-mentioned problems.

[0008] In short, after opening, since the thickness was recovered and it became thick, there were problems, such as being bulky, and the conventional disposable diaper also had inconvenience and the problem that it could not discard sanitarily in ** carrying of which it is hard to do ** wear (it is hard to make it wear). In case especially these problems carry each disposable diapers at the time of going out etc., they are remarkable. Moreover, at the time of going out, the diaper after use must be brought home in many cases. Therefore, the present condition is that the disposable diaper (or the package structure) without an above-mentioned problem is demanded.

[0009] Therefore, the purpose of this invention is compact, convenient to carry, is easy to wear, and is to offer the unit protection structure of the disposable diaper which can be discarded still more sanitarily.

[0010]

[Means for Solving the Problem] This invention is the unit-protection structure of the disposable diaper which comes to carry out the unit protection of the disposable diaper by the packing material, the above-mentioned packing material is sealed, and forms the unit-protection bag with which it comes to enclose a disposable diaper with the interior, and the above-mentioned purpose attains by providing the unit-protection structure of the disposable diaper characterized by to make the above-mentioned unit-protection bag as [maintain / the condition compressed the disposable diaper in the thickness direction]. Moreover, this invention offers the unit protection structure of the disposable diaper by which the above-mentioned disposable diaper is folded up and the unit protection is carried out. Moreover, this invention offers the unit protection structure of a disposable diaper where the above-mentioned disposable diaper is a disposable diaper of a trousers mold. Moreover, this invention offers the unit protection structure of a disposable diaper equipped with the firm attachment means which can reseal the above-mentioned packing material at the time of abandonment. Furthermore, as the desirable manufacture approach of the above-mentioned unit protection structure, this invention is the manufacture approach of the unit protection structure of a disposable diaper, after it covers the above-mentioned disposable diaper by the packing material, compresses and/or deaerates this disposable diaper with a packing material, and offers the manufacture approach of the unit protection structure of a diaper of providing a closure process which closes the predetermined location of this packing material.

[0011]

[Embodiment of the Invention] Hereafter, the unit protection structure of the disposable diaper of this invention is explained to a detail, referring to an accompanying drawing. In addition, in the following gestalten, the disposable diaper for small children is used for an example, and is explained. Drawing 1 is the perspective view showing the 1st gestalt of the unit protection structure of the disposable diaper of this invention here, drawing 2 is the perspective view showing the disposable diaper used in the unit protection structure shown in drawing 1, and drawing 3 is the development view showing the packing material used in the unit protection structure shown in drawing 1.

[0012] The unit protection structure 1 of the disposable diaper of this gestalt shown in drawing 1 comes to carry out the unit protection of the disposable diaper 2 by the packing material 3.

[0013] The disposable diaper 2 used in the above-mentioned unit protection structure 1 here As shown in drawing 2, junction immobilization is carried out, respectively and the right-and-left edges on both sides of the antinode flank 21 and the right-and-left edges on both sides of the back 22 become. It has at least one opening for the waists, and one pair of leg hole openings, and it is the disposable diaper of the trousers mold of a well-

known configuration, and the component (components, such as a top sheet, a backsheet, an absorber, and an elastic member) of each part material can also usually use a well-known thing without a limit especially. [0014] Moreover, as shown in drawing 3, the packing material 3 used in the above-mentioned unit protection structure 1 is a rectangle-like sheet, is used as 2 chip boxes in the bending section 31 in the center of a longitudinal direction, and forms the unit protection structure shown in drawing 1. As the above-mentioned sheet which forms the above-mentioned packing material 3, plastic film, such as the polyethylene and polypropylene which are excellent in joining workability, nylon, and a vinyl chloride, etc. is used preferably, and the polyethylene film is used especially in this gestalt. Moreover, 3 side 32 other than the above-mentioned bending section 31, and 33 and 34 are heat sealed, and the seal of the above-mentioned packing material 3 is carried out.

[0015] It forms unit protection bag 30 and the above-mentioned unit protection bag 30 is made as [maintain / the condition in which **, and the above-mentioned packing material 3 is sealed, and it comes to enclose the disposable diaper 2 with the interior of having compressed the disposable diaper 2 in the thickness direction]. Here, as compared with the condition of having left it in atmospheric air, it means maintaining the condition that thickness is thin for the above "the condition of having compressed in the thickness direction is maintained", without applying external force to a disposable diaper at all.

[0016] Furthermore, if it explains in full detail, the above-mentioned packing material 3 is bent in the bending section 31 shown in drawing 3, and as shown in drawing 1, the seal of 32, 33, and 34 will be carried out, and it will form three sides of sealed unit protection bags 30.

[0017] Moreover, the above-mentioned disposable diaper 2 is folded up, it is enclosed with the interior of the above-mentioned unit protection bag 30, and the unit protection is carried out. under the present circumstances, the above-mentioned disposable diaper 2 -- that vertical direction (direction which connects the antinode flank 21 and the length-from-the-crotch-to-the-cuff section 23) -- in the center (2a shown in drawing 2), it is mostly folded up towards the vertical direction. And as shown in drawing 1, it is the die length L1 of the above-mentioned unit protection bag 30. It is made as [become / twice / about / the die length L2 (vertical lay length) of the folded-up disposable diaper 2]. It has magnitude which can enclose and discard the diaper after use.

[0018] Moreover, as for the above-mentioned packing material 3, the usual firm attachment tape 35 for firm attachment is formed at the time of abandonment. the cross direction (direction corresponding to the cross direction of a diaper) of the unit protection bag 30 in which the above-mentioned firm attachment tape 35 was formed of the above-mentioned packing material 3 -- it is mostly allotted to the central part.

[0019] As for the thickness ratio of the disposable diaper 2 in the above-mentioned unit protection structure 1, considering as 15 - 85% is desirable, and considering as 40 - 60% is still more desirable. If a diaper becomes it hard that the above-mentioned thickness ratio is less than 15%, aesthetic property worsens and it exceeds 85%, since the effectiveness of suppressing recovery of thickness will become weaker, it is desirable to consider as above-mentioned within the limits. Here, it asks by carrying out the above "a thickness ratio" as following. That is, "the package structure which is that two or more common disposable diapers are packed" is opened, the thickness (thickness of the diaper folded up in this gestalt) of the diaper at the time of being ordinary temperature and normal relative humidity, and leaving a disposable diaper for seven days in the state of no-load is measured, and this is set to 100. And it asks by measuring the thickness (t shown in drawing 1) of the diaper in the "unit protection structure" of this invention, and indicating by percent to this. In addition, the above "thickness" is the product thickness of the diaper containing the absorber in the center of a crosswise abbreviation of a diaper.

[0020] Moreover, as shown in drawing 1, the notching notch 36 is formed in the above-mentioned unit protection bag 30 the 1 side 32, and it is made as [become / opening of the unit protection bag 30 / easy]. Moreover, in this gestalt, like ****, the sheet by which molecular orientation is carried out to 1 shaft orientations as a packing material 3 is used, and the above-mentioned notching notch 36 is formed towards this direction of molecular orientation. Since the direction and the direction of molecular orientation which tear the unit protection bag 30 are the same direction by this, opening of the unit protection bag 30 is easy.

[0021] Thus, by opening a bag from the above-mentioned notching notch 36, and taking out the disposable diaper 2, use can be presented with the unit protection structure 1 of this gestalt which it comes to constitute, and it encloses the diaper further removed from the wearer after use in the above-mentioned unit protection bag 30, can attach a bag firmly on the above-mentioned firm attachment tape 35, and can be discarded.

[0022] Since the unit protection structure 1 of this gestalt is constituted like ****, the elastic recovery to the

chip box of the disposable diaper 2 which the elastic recovery of the absorber of a diaper was restricted and was used as 2 chip boxes is also restricted. Therefore, while the disposable diaper 2 is enclosed with the unit protection bag 30 also in the no-load condition in the unit protection structure 1, there is nothing for which the thickness of a diaper is increased (it recovers), and while it has been compact, it is maintained, and excels in portability. Moreover, since it is what can be sealed and discarded in use and a bag like ****, it can discard sanitarily. Therefore, it excels as what is especially carried in the time of going out etc.

[0023] Subsequently, the manufacture approach of the unit protection structure 1 of this gestalt is explained with reference to drawing 4. Here, drawing 4 is the schematic diagram showing the important section of the desirable manufacture approach of the unit protection structure of the disposable diaper of this invention.

[0024] After covering the above-mentioned disposable diaper 2 by the packing material 3 as shown in drawing 4 in order to manufacture the unit protection structure 1 of this gestalt, it can carry out by compressing this disposable diaper 2 the whole packing material 3, extruding the air inside a packing material, and performing ** et al. and the closure process which deaerates compulsorily and closes the predetermined location of ** et al. and this packing material 3. In addition, processes other than the above-mentioned closure process, i.e., the production process of the disposable diaper 2 etc., can usually be performed especially, using a well-known approach without a limit.

[0025] If it explains in full detail, the above-mentioned closure process will enclose the disposable diaper 2 used as 2 chip boxes into the packing material 3 used as 2 chip boxes in the bending section 31. Furthermore, by the compression roll or the compression conveyor belt (not shown) Putting a pressure in the direction of an arrow head of drawing 4, i.e., the thickness direction of a diaper, and extruding the interior of a packing material 3, and the air in the disposable diaper 2, three sides, the seal of 32, 33, and 34 can be carried out, they can be closed, and the thing of a packing material 3 for which the unit protection bag 30 is formed can perform. And the package structure 1 of the 1st gestalt shown in drawing 1 can be manufactured by forming the notching notch 36 according to a conventional method, and sticking the firm attachment tape 35 further. Namely, the above-mentioned above "a predetermined location" by which the closure is carried out means the circumference part in a packing material 3 by which the closure is not carried out, and means 3 side 32 except the above-mentioned bending section 31, and 33 and 34 in this gestalt.

[0026] As the quality of the material of the above-mentioned compression roll or a compression conveyor, well-known ingredients, such as iron, rubber, sponge, and plastics, can be used. In order to obtain the unit protection product of strong compression, approaches, such as applying compression to a path clearance 0.5mm [for example,] crevice between the iron rolls of a linear pressure 10 - 20 kgf/cm, are used.

[0027] Moreover, in this gestalt, the folding gestalt of a diaper is not limited to the gestalt shown in drawing 1. For example, as shown in drawing 5, the side flap part 24 which is a part in which it is the right-and-left both sides of the antinode flank 21 and the back 22, and an absorber does not exist may be turned to a way among diapers, and you may insert it in, and may also fold it up. Moreover, as shown in drawing 6, you may also fold up towards the vertical direction so that a cross section may become W configuration.

[0028] Moreover, the so-called expansion type as shown in drawing 7 of disposable diaper is sufficient as the disposable diaper used for the unit protection structure of this invention. That is, a top sheet, a backseat, and the absorber that intervenes among both sheets can be provided, and the disposable diaper of the well-known expansion mold which an elastic member is allotted to the waist section and the leg section, respectively, and becomes so that it may be located in the periphery of an absorber can also be used. In this case, as shown in drawing 7, after disposable diaper 2A of an expansion mold inserts into a top sheet side side flap partial 24A which extends on both sides of that absorber, as for a diaper, it is desirable to be made 3 chip boxes so that it may become about C configurations. And as shown in drawing 8, it is desirable that disposable diaper 2A of the expansion mold used as 3 chip boxes is enclosed in unit protection bag 30A like the unit protection structure of the 1st above-mentioned gestalt, a unit protection is carried out, and unit protection structure 1A is formed.

[0029] Although a chip box is recovered, a configuration collapses and disposable diaper 2A of the folded-up expansion mold by which a unit protection is not carried out generally increases thickness according to the elastic recovery of an absorber, the elastic recovery of a material, or a contraction operation of an elastic member if it is in a no-load condition, compactability is not spoiled in unit protection structure 1A of this gestalt. Moreover, since the elastic member is prepared in the leg section in case the disposable diaper of the flat mold by which 3 chip boxes were carried out in this way is opened and use is presented, it curves to a brake-shoe type towards a top sheet side. For this reason, it excels in the wearing nature at the time of wear.

Therefore, it excels in portability and excels also in wearing nature.

[0030] Subsequently, with reference to drawing 9 and 10, other gestalten of the unit protection structure of this invention are explained. In addition, in the following gestalten, especially a different point from the 1st above-mentioned gestalt is explained. Especially about the point which is not explained in full detail, the explanation given in the 1st gestalt mentioned above is applied suitably. Here Drawing 9 is the perspective view showing the 2nd gestalt of the unit protection structure of the disposable diaper of this invention, and drawing 10 is the perspective view showing the 3rd gestalt of the unit protection structure of the disposable diaper of this invention.

[0031] In the 2nd gestalt shown in drawing 9, the magnitude of the unit protection bag 30 differs from the 1st above-mentioned gestalt. Namely, the die length L2 of the disposable diaper with which die-length L1' of the above-mentioned unit protection bag 30 was used as 2 chip boxes in the unit protection structure 1 of this gestalt as shown in drawing 9 It is made as [become / almost the same]. Moreover, the notching notch 36 is formed in the one-side 34 side.

[0032] In the 3rd gestalt shown in drawing 10, the configuration (closure configuration) of the unit protection bag 30 differs from the 1st above-mentioned gestalt. namely, -- drawing 10 -- being shown -- as -- a book -- a gestalt -- a unit protection -- structure -- one -- setting -- the above -- a unit protection -- a bag -- 30 -- a pyro -- a mold -- a unit protection -- a gestalt -- becoming -- as -- order -- both ends -- an edge -- 32 -- ' -- 33 -- ' -- and -- the whole surface -- a side -- it can set -- a center section -- 34 -- ' -- setting -- a seal -- carrying out -- having -- ****. Thus, especially the closure part (namely, closure configuration of the unit protection bag 30) of a packing material 3 is not restricted. Also in the 2-5th above-mentioned gestalten, the same effectiveness as the 1st above-mentioned gestalt is done so.

[0033] In addition, this invention is not restricted to an above-mentioned gestalt, and can be variously changed in the range which does not deviate from the meaning of this invention. For example, instead of forming the above-mentioned notching notch 36, a perforation etc. can be prepared, or the string for opening etc. can be installed in the unit protection bag 30, and opening can also be made easy. In addition, it is desirable for a unit protection bag to be fractured by opening in these cases, and to make it dust not generated. Moreover, as a means which can be resealed at the time of abandonment, the above-mentioned firm attachment tape 35 is formed, and also it can make it possible to close a unit protection bag at the time of abandonment by installing a string, or carrying out coating of the adhesives etc. beforehand, or forming magnitude in a bag so that it can band together with the bag itself. Moreover, it can paste up with not heat sealing but impulse heat sealing, or joining or adhesives by ultrasonic jointing and RF junction, or the seal of the above-mentioned unit protection bag 30 can carry out being stuck by pressure etc., and can be performed. Moreover, instead of deaerating the air in a unit protection bag on the occasion of manufacture of the unit protection structure 1 of this invention, putting the above-mentioned pressure, by inhalation-of-air PONFU etc., the closure may be performed, after carrying out the inhalation of air of the air in a unit protection bag. That is, the unit protection structure of this invention can also be manufactured by replacing with the compression and the closure process in the above-mentioned desirable manufacture approach, and performing degassing and the closure process which closes a predetermined KA place after attracting and deaerating the air in a unit protection bag.

[0034]

[Example] Hereafter, although an example and the example of a comparison explain this invention concretely, this invention is not limited to these.

[0035] [Example 1] The polyethylene film was used as a packing material, using the usual trousers mold disposable diaper which picked out two or more trousers mold diapers from the usual compression package article which comes to carry out a compression package as a disposable diaper. And the disposable diaper picked out from the compression package article was immediately enclosed into the packing material, it compressed by the 5 kgf/sheet compressive load, the air in a packing material was extruded, and each side of a packing material was heat sealed and closed further (closure process). In addition, the unit protection of the diaper was folded up and carried out to two, and it created the unit protection structure of the configuration shown in drawing 1. Moreover, compression was performed by putting an acrylic board on this unit protection bag, and putting the dead weight for the above-mentioned compressive load on it further, after putting in one diaper (thing in the condition of having folded up), into the unit protection bag which consists of a packing material. About the acquired unit protection structure, aging of thickness was investigated by making preservation conditions into ordinary temperature and normal relative humidity. The result is shown in drawing

11 . Moreover, thickness was measured using the dial gage (Mitutoyo Corp. make code No.575-113) and the stand (Mitutoyo Corp. make code No.7002). (n=10)

[0036] [Example 2] Except having made the compressive load into 15 kgf(s)/the sheet, unit-protection structure as well as an example 1 was acquired, and aging of the thickness of a diaper was measured. The result is shown in drawing 11 .

[0037] [Example 3] Except having made the compressive load into 25 kgf(s)/the sheet, unit protection structure as well as an example 1 was acquired, and aging of the thickness of a diaper was measured. The result is shown in drawing 11 .

[0038] [Example 1 of a comparison] Aging of the thickness of a diaper was measured like the example 1 except having considered only as the diaper except not considering as unit protection structure. The result is shown in drawing 11 .

[0039] Here, in the package structure of examples 1-3, the thickness change after progress was not seen on the 7th so that more clearly [the ratio / the above-mentioned thickness ratio might be 55% in 60% and the example 3 in 70% and an example 2 by the example 1, respectively and] than drawing 11 .

[0040]

[Effect of the Invention] The unit protection structure of the disposable diaper of this invention is convenient for compact and sanitary carrying, is easy to wear, and can be discarded still more sanitarily.

[0041] Specifically, the inside of ** unit protection bag does not become the thickness more than thickness with a fixed absorber until it is intercepted from the open air, and the air of the perimeter which is needed in order that an absorber may recover the thickness does not exist but it opens a unit protection bag. Therefore, also in the state of no-load, the unit protection structure of this invention is compact, and it is easy for it to excel in portability, and for a wearer to equip or to make a wearer equip.

** Since a used disposable diaper is enclosed in the opened unit protection bag and can be discarded, it can discard sanitarily, without giving off a smell outside.

** Since the unit protection is carried out, carrying is sanitarily possible, and since air cannot be touched, it is also very sanitarily more possible still preservation and to control discoloration with time and degradation of product performance.

[Translation done.]

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PRIOR ART

[The technique in which invention belongs] This invention still more specifically relates to the unit protection structure of a disposable diaper excellent in compact and sanitary carrying nature about the unit protection structure of the disposable diaper which comes to carry out the unit protection of the disposable diaper used in order to carry out hold maintenance of the excrement as the object for small children, the object for adults, and an object for incontinentia persons by the packing material.

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EFFECT OF THE INVENTION

[Effect of the Invention] The unit protection structure of the disposable diaper of this invention is convenient for compact and sanitary carrying, is easy to wear, and can be discarded still more sanitarily.

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TECHNICAL PROBLEM

[Description of the Prior Art] As a disposable diaper, it is the disposable diaper of the flat mold which has conclusion means, such as a tape fastener. (It is hereafter called a "flat mold diaper") is mainly used, and also recently, junction immobilization of the right-and-left edges on both sides of the antinode flank of a diaper and the right-and-left edges on both sides of the back is carried out, and the disposable diaper (henceforth a "trousers mold diaper") of the trousers mold with which it comes to form leg opening of a right-and-left pair and one waist opening is used widely.

[0003] Such a disposable diaper usually carries out folding up etc., several sheets pack it, is packed and is sold. after turn to a top sheet side the side flap which be propose variously, for example, have extend on right and left both sides of an absorber in the flat mold diaper and fold it up about the approach of fold up a disposable diaper conventionally, the approach of fold up at 3 chip boxes be propose so that a diaper may be classify into three, an antinode flank, the back, and the length from the crotch to the cuff section. And since according to this approach a certain amount of chip box peculiarity sticks when it develops at the time of use, the configuration where the diaper met the model of a ship, i.e., a wearer's form, towards that longitudinal direction is presented, and there is an advantage that wearing nature is good. On the other hand, although folding up etc. is not carried out especially generally in the trousers mold diaper, in order to fold up in a compact, to raise portability, to improve appearance of a package condition and to make it be hard to fall at the time of exhibition at a shop front, recently, the approach to insert in versatility is proposed.

[0004] By the way, as an absorber of a disposable diaper, split pulp is used as a principal member and, generally the thing which comes to use a macromolecule water absorption polymer together is used. Although this split pulp is the absorbency high material which can come to hand comparatively cheaply and it is used for almost all the disposable diaper, in recent years, it replaces with this split pulp, and a synthetic fiber is used or mixing and using this split pulp and a synthetic fiber is also proposed.

[0005] The above-mentioned absorber has the thickness according to the amount of the split pulp currently used or the synthetic fiber used. Generally, the thinness of a disposable diaper is greatly dependent on the thickness of an absorber. It is because it is difficult to choose an ingredient and to raise effectiveness so that thickness of members other than an absorber may be made thin when it is going to make product thickness of a disposable diaper very thin. Therefore, the thinness of a disposable diaper is dependent on the amount of the split pulp which constitutes an absorber, or the synthetic fiber used. Here, when the thickness per sheet of a disposable diaper is too large, and a wearer is made to carry a disposable diaper, there is a problem it is not only ill-shaped, but that become inconvenient to carrying and reservation of a conveyance tooth space or the selling tooth space in a shop front becomes difficult. For this reason, it is requested that a disposable diaper is thin-shape-ized, maintaining product performance.

[0006] Then, although it considers making thickness of a disposable diaper thin by reducing the amount of fiber used for the absorber of a disposable diaper, there is a limitation in making thickness thin, maintaining the engine performance of a disposable diaper. Moreover, making thin thickness of (this especially press process is a process which compresses and fabricates an absorber simple substance), and a diaper is also proposed by performing a press process in the production process of a diaper. However, since fiber has elasticity even if it is the absorber compressed with a press, surrounding air enters the crevice produced when fiber carries out elastic recovery, and the thickness of a diaper is recovered with time amount (thickness will be increased). Moreover, by the time it cannot carry out elastic recovery, when it will compress, there is a problem that a disposable diaper becomes hard to Paris Paris too much, or the engine performance falls extremely. For example, although the compression package of most is carried out, when the disposable diaper by which current marketing is

carried out is once picked out from a bag and leaves it in the load zero state for several hours, the thickness swells and the problem of being inferior has it in the portability at the time of carrying.

[0007] Moreover, although the disposable diaper which it finished using is discarded by the garbage can, even if it rounds off in a compact considerably, some smell remains, and there is a problem of becoming the cause of the offensive odor in a garbage can. If it is in a trousers mold diaper especially, since it is seldom rounded off by the compact, there are many above-mentioned problems.

[0008] In short, after opening, since the thickness was recovered and it became thick, there were problems, such as being bulky, and the conventional disposable diaper also had inconvenience and the problem that it could not discard sanitarily in ** carrying of which it is hard to do ** wear (it is hard to make it wear). In case especially these problems carry each disposable diapers at the time of going out etc., they are remarkable. Moreover, at the time of going out, the diaper after use must be brought home in many cases. Therefore, the present condition is that the disposable diaper (or the package structure) without an above-mentioned problem is demanded.

[0009] Therefore, the purpose of this invention is compact, convenient to carry, is easy to wear, and is to offer the unit protection structure of the disposable diaper which can be discarded still more sanitarily.

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MEANS

[Means for Solving the Problem] This invention is the unit-protection structure of the disposable diaper which comes to carry out the unit protection of the disposable diaper by the packing material, the above-mentioned packing material is sealed, and forms the unit-protection bag with which it comes to enclose a disposable diaper with the interior, and the above-mentioned purpose attains by providing the unit-protection structure of the disposable diaper characterized by to make the above-mentioned unit-protection bag as [maintain / the condition compressed the disposable diaper in the thickness direction]. Moreover, this invention offers the unit protection structure of the disposable diaper by which the above-mentioned disposable diaper is folded up and the unit protection is carried out. Moreover, this invention offers the unit protection structure of a disposable diaper where the above-mentioned disposable diaper is a disposable diaper of a trousers mold. Moreover, this invention offers the unit protection structure of a disposable diaper equipped with the firm attachment means which can reseal the above-mentioned packing material at the time of abandonment. Furthermore, as the desirable manufacture approach of the above-mentioned unit protection structure, this invention is the manufacture approach of the unit protection structure of a disposable diaper, after it covers the above-mentioned disposable diaper by the packing material, compresses and/or deaerates this disposable diaper with a packing material, and offers the manufacture approach of the unit protection structure of a diaper of providing a closure process which closes the predetermined location of this packing material.

[0011]

[Embodiment of the Invention] Hereafter, the unit protection structure of the disposable diaper of this invention is explained to a detail, referring to an accompanying drawing. In addition, in the following gestalten, the disposable diaper for small children is used for an example, and is explained. Drawing 1 is the perspective view showing the 1st gestalt of the unit protection structure of the disposable diaper of this invention here, drawing 2 is the perspective view showing the disposable diaper used in the unit protection structure shown in drawing 1, and drawing 3 is the development view showing the packing material used in the unit protection structure shown in drawing 1.

[0012] The unit protection structure 1 of the disposable diaper of this gestalt shown in drawing 1 comes to carry out the unit protection of the disposable diaper 2 by the packing material 3.

[0013] The disposable diaper 2 used in the above-mentioned unit protection structure 1 here As shown in drawing 2, junction immobilization is carried out, respectively and the right-and-left edges on both sides of the antinode flank 21 and the right-and-left edges on both sides of the back 22 become. It has at least one opening for the waists, and one pair of leg hole openings, and it is the disposable diaper of the trousers mold of a well-known configuration, and the component (components, such as a top sheet, a backseat, an absorber, and an elastic member) of each part material can also usually use a well-known thing without a limit especially.

[0014] Moreover, as shown in drawing 3, the packing material 3 used in the above-mentioned unit protection structure 1 is a rectangle-like sheet, is used as 2 chip boxes in the bending section 31 in the center of a longitudinal direction, and forms the unit protection structure shown in drawing 1. As the above-mentioned sheet which forms the above-mentioned packing material 3, plastic film, such as the polyethylene and polypropylene which are excellent in joining workability, nylon, and a vinyl chloride, etc. is used preferably, and the polyethylene film is used especially in this gestalt. Moreover, 3 side 32 other than the above-mentioned bending section 31, and 33 and 34 are heat sealed, and the seal of the above-mentioned packing material 3 is carried out.

[0015] It forms unit protection bag 30 and the above-mentioned unit protection bag 30 is made as [maintain / the condition in which **, and the above-mentioned packing material 3 is sealed, and it comes to enclose the

disposable diaper 2 with the interior of having compressed the disposable diaper 2 in the thickness direction]. Here, as compared with the condition of having left it in atmospheric air, it means maintaining the condition that thickness is thin for the above "the condition of having compressed in the thickness direction is maintained", without applying external force to a disposable diaper at all.

[0016] Furthermore, if it explains in full detail, the above-mentioned packing material 3 is bent in the bending section 31 shown in drawing 3 , and as shown in drawing 1 , the seal of 32, 33, and 34 will be carried out, and it will form three sides of sealed unit protection bags 30.

[0017] Moreover, the above-mentioned disposable diaper 2 is folded up, it is enclosed with the interior of the above-mentioned unit protection bag 30, and the unit protection is carried out. under the present circumstances, the above-mentioned disposable diaper 2 -- that vertical direction (direction which connects the antinode flank 21 and the length-from-the-crotch-to-the-cuff section 23) -- in the center (2a shown in drawing 2), it is mostly folded up towards the vertical direction. And as shown in drawing 1 , it is the die length L1 of the above-mentioned unit protection bag 30. It is made as [become / twice / about / the die length L2 (vertical lay length) of the folded-up disposable diaper 2]. It has magnitude which can enclose and discard the diaper after use.

[0018] Moreover, as for the above-mentioned packing material 3, the usual firm attachment tape 35 for firm attachment is formed at the time of abandonment. the cross direction (direction corresponding to the cross direction of a diaper) of the unit protection bag 30 in which the above-mentioned firm attachment tape 35 was formed of the above-mentioned packing material 3 -- it is mostly allotted to the central part.

[0019] As for the thickness ratio of the disposable diaper 2 in the above-mentioned unit protection structure 1, considering as 15 - 85% is desirable, and considering as 40 - 60% is still more desirable. If a diaper becomes it hard that the above-mentioned thickness ratio is less than 15%, aesthetic property worsens and it exceeds 85%, since the effectiveness of suppressing recovery of thickness will become weaker, it is desirable to consider as above-mentioned within the limits. Here, it asks by carrying out the above "a thickness ratio" as following. That is, "the package structure which is that two or more common disposable diapers are packed" is opened, the thickness (thickness of the diaper folded up in this gestalt) of the diaper at the time of being ordinary temperature and normal relative humidity, and leaving a disposable diaper for seven days in the state of no-load is measured, and this is set to 100. And it asks by measuring the thickness (t shown in drawing 1) of the diaper in the "unit protection structure" of this invention, and indicating by percent to this. In addition, the above "thickness" is the product thickness of the diaper containing the absorber in the center of a crosswise abbreviation of a diaper.

[0020] Moreover, as shown in drawing 1 , the notching notch 36 is formed in the above-mentioned unit protection bag 30 the 1 side 32, and it is made as [become / opening of the unit protection bag 30 / easy]. Moreover, in this gestalt, like ****, the sheet by which molecular orientation is carried out to 1 shaft orientations as a packing material 3 is used, and the above-mentioned notching notch 36 is formed towards this direction of molecular orientation. Since the direction and the direction of molecular orientation which tear the unit protection bag 30 are the same direction by this, opening of the unit protection bag 30 is easy.

[0021] Thus, by opening a bag from the above-mentioned notching notch 36, and taking out the disposable diaper 2, use can be presented with the unit protection structure 1 of this gestalt which it comes to constitute, and it encloses the diaper further removed from the wearer after use in the above-mentioned unit protection bag 30, can attach a bag firmly on the above-mentioned firm attachment tape 35, and can be discarded.

[0022] Since the unit protection structure 1 of this gestalt is constituted like ****, the elastic recovery to the chip box of the disposable diaper 2 which the elastic recovery of the absorber of a diaper was restricted and was used as 2 chip boxes is also restricted. Therefore, while the disposable diaper 2 is enclosed with the unit protection bag 30 also in the no-load condition in the unit protection structure 1, there is nothing for which the thickness of a diaper is increased (it recovers), and while it has been compact, it is maintained, and excels in portability. Moreover, since it is what can be sealed and discarded in use and a bag like ****, it can discard sanarily. Therefore, it excels as what is especially carried in the time of going out etc.

[0023] Subsequently, the manufacture approach of the unit protection structure 1 of this gestalt is explained with reference to drawing 4 . Here, drawing 4 is the schematic diagram showing the important section of the desirable manufacture approach of the unit protection structure of the disposable diaper of this invention.

[0024] After covering the above-mentioned disposable diaper 2 by the packing material 3 as shown in drawing 4 in order to manufacture the unit protection structure 1 of this gestalt, it can carry out by compressing this disposable diaper 2 the whole packing material 3, extruding the air inside a packing material, and performing **

et al. and the closure process which deaerates compulsorily and closes the predetermined location of ** et al. and this packing material 3. In addition, processes other than the above-mentioned closure process, i.e., the production process of the disposable diaper 2 etc., can usually be performed especially, using a well-known approach without a limit.

[0025] If it explains in full detail, the above-mentioned closure process will enclose the disposable diaper 2 used as 2 chip boxes into the packing material 3 used as 2 chip boxes in the bending section 31. Furthermore, by the compression roll or the compression conveyor belt (not shown) Putting a pressure in the direction of an arrow head of drawing 4 , i.e., the thickness direction of a diaper, and extruding the interior of a packing material 3, and the air in the disposable diaper 2, three sides, the seal of 32, 33, and 34 can be carried out, they can be closed, and the thing of a packing material 3 for which the unit protection bag 30 is formed can perform. And the package structure 1 of the 1st gestalt shown in drawing 1 can be manufactured by forming the notching notch 36 according to a conventional method, and sticking the firm attachment tape 35 further. Namely, the above-mentioned above "a predetermined location" by which the closure is carried out means the circumference part in a packing material 3 by which the closure is not carried out, and means 3 side 32 except the above-mentioned bending section 31, and 33 and 34 in this gestalt.

[0026] As the quality of the material of the above-mentioned compression roll or a compression conveyor, well-known ingredients, such as iron, rubber, sponge, and plastics, can be used. In order to obtain the unit protection product of strong compression, approaches, such as applying compression to a path clearance 0.5mm [for example,] crevice between the iron rolls of a linear pressure 10 - 20 kgf/cm, are used.

[0027] Moreover, in this gestalt, the folding gestalt of a diaper is not limited to the gestalt shown in drawing 1 . For example, as shown in drawing 5 , the side flap part 24 which is a part in which it is the right-and-left both sides of the antinode flank 21 and the back 22, and an absorber does not exist may be turned to a way among diapers, and you may insert it in, and may also fold it up. Moreover, as shown in drawing 6 , you may also fold up towards the vertical direction so that a cross section may become W configuration.

[0028] Moreover, the so-called expansion type as shown in drawing 7 of disposable diaper is sufficient as the disposable diaper used for the unit protection structure of this invention. That is, a top sheet, a backseat, and the absorber that intervenes among both sheets can be provided, and the disposable diaper of the well-known expansion mold which an elastic member is allotted to the waist section and the leg section, respectively, and becomes so that it may be located in the periphery of an absorber can also be used. In this case, as shown in drawing 7 , after disposable diaper 2A of an expansion mold inserts into a top sheet side side flap partial 24A which extends on both sides of that absorber, as for a diaper, it is desirable to be made 3 chip boxes so that it may become about C configurations. And as shown in drawing 8 , it is desirable that disposable diaper 2A of the expansion mold used as 3 chip boxes is enclosed in unit protection bag 30A like the unit protection structure of the 1st above-mentioned gestalt, a unit protection is carried out, and unit protection structure 1A is formed.

[0029] Although a chip box is recovered, a configuration collapses and disposable diaper 2A of the folded-up expansion mold by which a unit protection is not carried out generally increases thickness according to the elastic recovery of an absorber, the elastic recovery of a material, or a contraction operation of an elastic member if it is in a no-load condition, compactability is not spoiled in unit protection structure 1A of this gestalt. Moreover, since the elastic member is prepared in the leg section in case the disposable diaper of the flat mold by which 3 chip boxes were carried out in this way is opened and use is presented, it curves to a brake-shoe type towards a top sheet side. For this reason, it excels in the wearing nature at the time of wear. Therefore, it excels in portability and excels also in wearing nature.

[0030] Subsequently, with reference to drawing 9 and 10, other gestalten of the unit protection structure of this invention are explained. In addition, in the following gestalten, especially a different point from the 1st above-mentioned gestalt is explained. Especially about the point which is not explained in full detail, the explanation given in the 1st gestalt mentioned above is applied suitably. Here Drawing 9 is the perspective view showing the 2nd gestalt of the unit protection structure of the disposable diaper of this invention, and drawing 10 is the perspective view showing the 3rd gestalt of the unit protection structure of the disposable diaper of this invention.

[0031] In the 2nd gestalt shown in drawing 9 , the magnitude of the unit protection bag 30 differs from the 1st above-mentioned gestalt. Namely, the die length L2 of the disposable diaper with which die-length L1' of the above-mentioned unit protection bag 30 was used as 2 chip boxes in the unit protection structure 1 of this gestalt as shown in drawing 9 It is made as [become / almost the same]. Moreover, the notching notch 36 is

formed in the one-side 34 side.

[0032] In the 3rd gestalt shown in drawing 10 , the configuration (closure configuration) of the unit protection bag 30 differs from the 1st above-mentioned gestalt. namely, -- drawing 10 -- being shown -- as -- a book -- a gestalt -- a unit protection -- structure -- one -- setting -- the above -- a unit protection -- a bag -- 30 -- a pyro -- a mold -- a unit protection -- a gestalt -- becoming -- as -- order -- both ends -- an edge -- 32 -- ' -- 33 -- ' -- and -- the whole surface -- a side -- it can set -- a center section -- 34 -- ' -- setting -- a seal -- carrying out -- having -- **** . Thus, especially the closure part (namely, closure configuration of the unit protection bag 30) of a packing material 3 is not restricted. Also in the 2-5th above-mentioned gestalten, the same effectiveness as the 1st above-mentioned gestalt is done so.

[0033] In addition, this invention is not restricted to an above-mentioned gestalt, and can be variously changed in the range which does not deviate from the meaning of this invention. For example, instead of forming the above-mentioned notching notch 36, a perforation etc. can be prepared, or the string for opening etc. can be installed in the unit protection bag 30, and opening can also be made easy. In addition, it is desirable for a unit protection bag to be fractured by opening in these cases, and to make it dust not generated. Moreover, as a means which can be resealed at the time of abandonment, the above-mentioned firm attachment tape 35 is formed, and also it can make it possible to close a unit protection bag at the time of abandonment by installing a string, or carrying out coating of the adhesives etc. beforehand, or forming magnitude in a bag so that it can band together with the bag itself. Moreover, it can paste up with not heat sealing but impulse heat sealing, or joining or adhesives by ultrasonic jointing and RF junction, or the seal of the above-mentioned unit protection bag 30 can carry out being stuck by pressure etc., and can be performed. Moreover, instead of deaerating the air in a unit protection bag on the occasion of manufacture of the unit protection structure 1 of this invention, putting the above-mentioned pressure, by inhalation-of-air PONFU etc., the closure may be performed, after carrying out the inhalation of air of the air in a unit protection bag. That is, the unit protection structure of this invention can also be manufactured by replacing with the compression and the closure process in the above-mentioned desirable manufacture approach, and performing degassing and the closure process which closes a predetermined KA place after attracting and deaerating the air in a unit protection bag.

[Translation done.]

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EXAMPLE

[Example] Hereafter, although an example and the example of a comparison explain this invention concretely, this invention is not limited to these.

[0035] [Example 1] The polyethylene film was used as a packing material, using the usual trousers mold disposable diaper which picked out two or more trousers mold diapers from the usual compression package article which comes to carry out a compression package as a disposable diaper. And the disposable diaper picked out from the compression package article was immediately enclosed into the packing material, it compressed by the 5 kgf/sheet compressive load, the air in a packing material was extruded, and each side of a packing material was heat sealed and closed further (closure process). In addition, the unit protection of the diaper was folded up and carried out to two, and it created the unit protection structure of the configuration shown in drawing 1. Moreover, compression was performed by putting an acrylic board on this unit protection bag, and putting the dead weight for the above-mentioned compressive load on it further, after putting in one diaper (thing in the condition of having folded up), into the unit protection bag which consists of a packing material. About the acquired unit protection structure, aging of thickness was investigated by making preservation conditions into ordinary temperature and normal relative humidity. The result is shown in drawing 11. Moreover, thickness was measured using the dial gage (Mitutoyo Corp. make code No.575-113) and the stand (Mitutoyo Corp. make code No.7002). (n=10)

[0036] [Example 2] Except having made the compressive load into 15 kgf(s)/the sheet, unit protection structure as well as an example 1 was acquired, and aging of the thickness of a diaper was measured. The result is shown in drawing 11.

[0037] [Example 3] Except having made the compressive load into 25 kgf(s)/the sheet, unit protection structure as well as an example 1 was acquired, and aging of the thickness of a diaper was measured. The result is shown in drawing 11.

[0038] [Example 1 of a comparison] Aging of the thickness of a diaper was measured like the example 1 except having considered only as the diaper except not considering as unit protection structure. The result is shown in drawing 11.

[0039] Here, in the package structure of examples 1-3, the thickness change after progress was not seen on the 7th so that more clearly [the ratio / the above-mentioned thickness ratio might be 55% in 60% and the example 3 in 70% and an example 2 by the example 1, respectively and] than drawing 11.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing 1 is the perspective view showing the 1st gestalt of the unit protection composition of the disposable diaper of this invention.

[Drawing 2] Drawing 2 is the perspective view showing the disposable diaper used in the unit protection structure shown in drawing 1 .

[Drawing 3] Drawing 3 is the development view showing the packing material used in the unit protection structure shown in drawing 1 .

[Drawing 4] Drawing 4 is the schematic diagram showing the important section of the manufacture approach of the unit protection structure of the disposable diaper of this invention.

[Drawing 5] Drawing 5 is the perspective view showing other examples of the folding gestalt of the disposable diaper in the 1st gestalt.

[Drawing 6] Drawing 6 is the perspective view showing other examples of the folding gestalt of the disposable diaper in the 1st gestalt.

[Drawing 7] Drawing 7 is the perspective view showing other examples of the disposable diaper used in the 1st gestalt.

[Drawing 8] Drawing 8 is the perspective view showing the 1st gestalt of the unit protection structure of the disposable diaper of this invention of coming to use the disposable diaper shown in drawing 7 .

[Drawing 9] Drawing 9 is the perspective view showing the 2nd gestalt of the unit protection structure of the disposable diaper of this invention.

[Drawing 10] Drawing 10 is the perspective view showing the 3rd gestalt of the unit protection structure of the disposable diaper of this invention.

[Drawing 11] Drawing 11 is a graph which shows the result of an example and the example of a comparison.

[Description of Notations]

1 Unit Protection Structure

2 Disposable Diaper

21 Antinode Flank

22 Back

23 Length-from-the-Crotch-to-the-Cuff Section

24 Side Flap Part

3 Packing Material

30 Unit Protection Bag

31 Bending Section

32 One Side

33 One Side

34 One Side

35 Firm Attachment Tape

36 Notching Notch

[Translation done.]

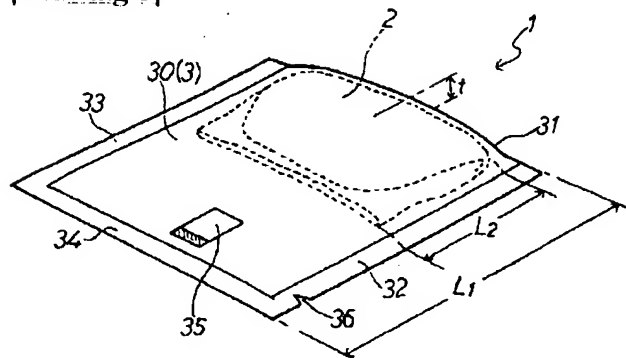
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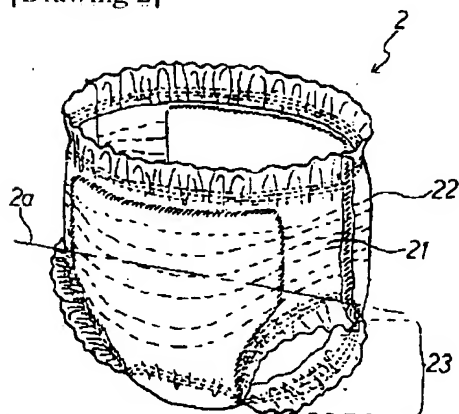
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DRAWINGS

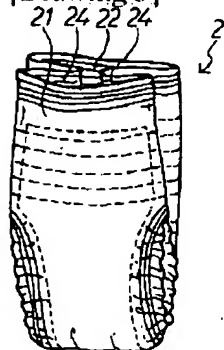
[Drawing 1]



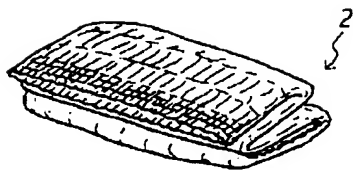
[Drawing 2]



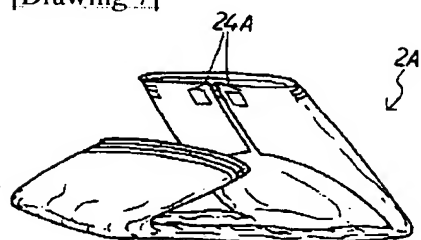
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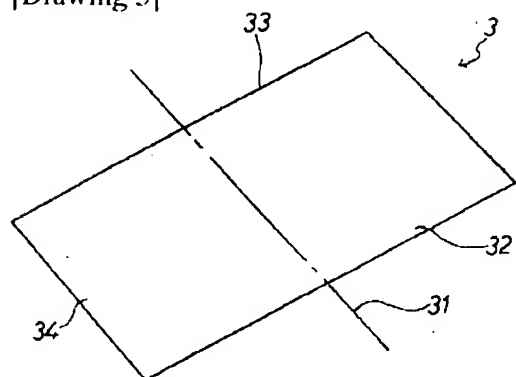
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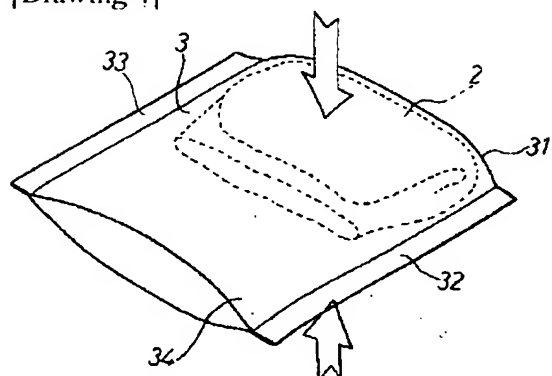
[Drawing 7]



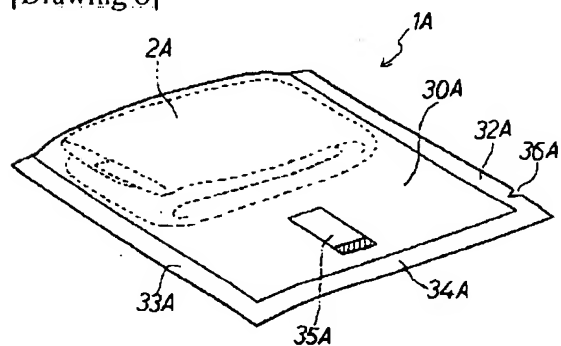
[Drawing 3]



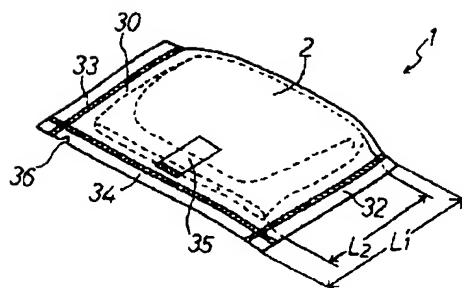
[Drawing 4]



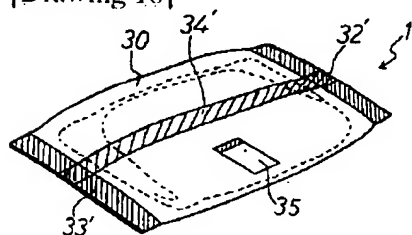
[Drawing 8]



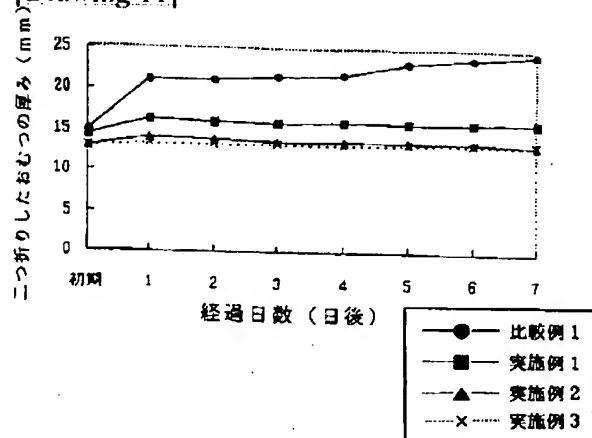
[Drawing 9]



[Drawing 10]



[Drawing 11]



[Translation done.]